PJSC "Ilyich Iron and Steel Works of Mariupol" (Ukraine)

Company's business profile
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ANNOTATION

This report (business portrait) is a description of one of the largest Ukrainian steel companies - JSC "Ilyich Iron and Steel Works of Mariupol".

The report consists of 11 sections, contains 108 pages and includes 12 tables, 9 figures and 5 appendices.

The business portrait is based on desk research. As information sources, data Ukrstat (the State Statistics Committee of Ukraine), the State Customs Service of Ukraine, official statistics of rail transport, annual and quarterly reports of issuers of securities, as well as Internet sites of companies-producers were employed.

The first section is a general information about the company.

The second section provides data about the structure and capacities of the enterprise, its product mix.

The third section gives the volume of output of products for various processes and their dynamics, and discusses the development trends.

The fourth section is devoted to sources of raw materials and their suppliers, both domestic and foreign.

Marketing of products is discussed in the fifth section, supplies on the domestic market and for export are considered separately.

The sixth section we consider the competence of the company, determining its competitiveness.

Data on productivity, staffing, compensation can be found in the seventh section.

The privatization of the company, its course, the shareholders and their impact on the company are described in the eighth section.

Data on the financial condition of the company during the years 2001-2013 are shown in the ninth section.

The tenth section is devoted to the development program of the enterprise and the implementation of planned projects.

The eleventh and final section is devoted to one of the most important areas of functioning of industrial companies at the present stage - environmental activities.

Appendices provide information about the main technological equipment and its characteristics, the enlarged product portfolio, the geographical structure of exports of rolled products by kinds in 2001-2013, as well as the company address book.
1. General information

Mariupol Ilyich Integrated Iron-and-Steel Works, located in the city of Mariupol, the Donetsk region, at Azov Sea coast, is one of the largest steelmakers in Ukraine. The enterprise was commissioned in the end of 19th century by the Nikopol-Mariupol company. In 1897, the first products were yielded by the Works pipe-electrowelding plant, and by the end of the year were commissioned the open-hearth and rolling shops. Later, the enterprise was repeatedly reconstructed and expanded.

The accommodation of the business in this region was due to the proximity to sources of raw materials, fuel and energy resources, the presence of the sea port, which makes it possible to transport metal by sea, the availability of workforce in surrounding villages.

Currently Mariupol Ilyich is a company with a complete metallurgical cycle. The main products that are manufactured at the plant are: high quality flat-rolled steel for critical structures, shipbuilding, oil pipelines, gas and water pipes, compressed gas cylinders, as well as trade sinter, pig iron.

In addition, the plant manufactures cast and rolled slabs, steel strip, granulated slag, graded gravel and other products.

The combine is specialized in releasing various kinds of flat products. The company supplies its products to the both domestic and foreign markets. The plant's products are exported to over 70 countries.

The company is a leader in the production of steel plate, steel sheet, galvanized and tin, metal-filled plastic, tin plate.

In autumn 2010, Mariupol Ilyich became part of the Metinvest Group.
2. The enterprise structure, capacities, range of products

Mariupol Ilyich is the company with a complete metallurgical cycle. Design capacities of the enterprise at the beginning of 2014 amount to about XX million tons of sinter, XX million tons of pig iron, XX million tons steel, including XX million tons of converter steel, XX million tons of open-hearth steel and more than XX million tons of finished rolled steel per year.

The enterprise structure includes (Fig. 1):

The sintering plant is the largest in Ukraine and Europe, including XX sintering facilities with caking area of XX m$^2$ each. The total (design) capacity is XX million tons per year of sinter. The plant satisfied the demand (for sinter) of Mariupol Ilyich completely and allows to supply sinter to consumers on the domestic market, in particular, to MMC Azovstal. All technological processes are mechanized and automated.

The utilization of productive capacities of the plant in 2009 was 66.3%, in 2010 – 91.8 %, in 2011 – XX %, and in 2012 – XX %, in 2013 – XX %.

The blast furnace plant consists of five furnaces (including BF #1 of the useful volume of 1,033 m$^3$, #2 – 1,300 m$^3$, #3 – XX m$^3$, #4 – XX m$^3$, and #5 – XX m$^3$), four casters and the section of iron desulfurization in ladles.

Since July 2012 BF-2 is on conservatism. As of 31 October 2014 due to lack of raw materials only 3 blast furnaces were operating.

The most of manufactured iron is delivered to the steelmaking plants of the combine to produce steel and partly is cast by filling machines for selling pig iron on the domestic and foreign markets.

The manufactured iron has a low content of phosphor and sulfur, which allows it to be used for smelting of the most important steel grades and to be widely employed in foundry of machine building enterprises. Upon the requirements of the purchaser the sulfur content in the iron may be reduced to 0.001-0.003% (by treating at the desulfurisation facility).

The use of oxygen and gas in blowing, the introduction of high temperature air heaters, the automated charge feed with the separation of sinter fines before charging, modern charging devices, a hydrocleaning system and an effective ventilation under hoppers, the mechanization of hearth operations provide for the high technological level of metal-smelting and good working conditions.

In June 2014 Mariupol Ilyich for the first time in the history of the company performed the blowing of BF #4 without natural gas. Thus, the plant opened the prospect of a complete renunciation of the use of this expensive energy source in blast furnaces.
Compared with several other Ukrainian metallurgical enterprises in blast furnaces of MMC Mariupol Ilyich the blast furnace smelting is carried out at an air-blast temperature of over 1100°C (1046.9°C on average at the Ukrainian metal works) and at a blast furnace gas pressure of about 1 atm.

In the pig iron production, the combine mainly uses sinter. The use of pellets is small.

Flaming slags from blast furnaces and slages of the steelmaking production, furnace clinker (from rolling mills of the plant or coming from the side) are fully processed and prepared for disposal in the shop of processing slags and waste products. During the processing of slag metal inclusions are completely removed, sorted by size, and then used in charges of blast and steel units.

The design capacity of the iron production in 2011 was XX million tons per year. The capacity utilization of the blast furnace shop in 2009 was 86%, in 2010 - 85.2%, in 2011 – XX %, in 2012 – XX %, and in 2013 – XX %.

Steelmaking production includes an open-hearth and an oxygen-converter shops.

The open hearth shop of the capacity of XX million tons per year has 4 OH furnaces (2 open-hearth furnaces (#1 and #2) were decommissioned in 2010), including 1 single-bath unit of the rated capacity of XX tons and 3 single-bath units of the rated capacity of XX tons each. The shop is specialized in the smelting of both carbon and low-alloyed steels. All steel is cast completely into slabs of XX tons.

The furnaces are equipped with installations for the continuous measurement of the steel temperature during refining.

In the production of open-hearth steel MMC Mariupol Ilyich uses as the steelmaking charge iron, scrap iron, metallized pellets, iron ore, and deoxidizing and alloying agents. In the structure of the charge pig iron prevails.

The rated capacity of the open-hearth shop is XX million tons per year, and the capacity utilization was in 2010 - 83.4%, in 2011 – 94.5%, in 2012 – XX %, and in 2013 – XX %.

In 2014, the operation of the shop of open-hearth furnaces was suspended (furnaces are on standby).

The oxygen converter shop includes three XX -ton converters and three 1-strand slab continuous casters (CCM), two of which were commissioned in 1993, and the third one, a slab caster of the capacity of 1 million tons per year, was launched in 2006. After renovation, carried out on all CCM, their productivity increased from XX thousand tons to XX thousand tons per machine.

As of 31 October 2014, due to lack of raw materials only XX the converters were operating. The third converter was stopped for reconstruction.

The shop specializes in smelting of both the carbon (for instance, for the autobody sheet) and low-alloyed (for instance for welded pipes) steels. The largest part of steel in the shop currently is cast on the continuous casting machines (casters).

Various facilities for secondary metallurgy treatment of iron and steel are used in manufacturing process. Desulfurisation, modification, micro-alloying and alloying
of steel are carried out by means of slag-forming mixtures, and also by adding of powderwire with different fillers to the ladle with the steel.

In the shop the technology of torch gunning of the converter lining was worked out and put into practice, which allowed to increase the lining resistance.

The rated productive capacity of the converter shop in 2009-2011 was XX million tons per year, and the capacity utilization was higher than the installed capacity. In 2009 it amounted to 109.8%, in 2010 - 116.3%, in 2011 - XX %. In 2012, the production capacities for oxygen steel were increased to XX million tons, and the level of their utilization amounted to XX % in 2012, and XX % in 2013.

The production of steel for casting and forging is conducted in XX electric furnaces, 2 of which have the rated capacity of XX tons each with the transformer power of 9 MW and 2 have the capacity of XX tons each with transformer power of 1.8 MW.

The design capacity is XX thousand tons, its utilization amounted to: in 2009 - 15.0%, in 2010 – 19.7%, in 2011 – 16.6%, in 2012 – XX %, and in 2013 – XX %.

**Rolling production** includes:

A **slabbing mill** XX mm (since 2009 – a section of LPTs-1700) with the capacity of XX million tons per year, it specializes in the production of billets (slabs) of 130-230x1000-1550 mm and of length of XX m from low-alloyed and alloyed steels. It has XX soaking pits with central heating, universal blooming stand XX, manipulator, ingot manipulator, slab shears and other equipment.

Re-rolling slabs intended for sheet rolling are transferred in hot condition to the HR1700 mm mill of hot rolling area or directly to the roughing train (transit rolling).

The rated production capacity of the slabbing mill is XX million tons per year, and the capacity utilization in 2009 was 34.2%; in 2010 – 45.3%, in 2011 – XX %, in 2012 – XX %, and in 2013 – XX %.

In 2009, the section was eliminated (as a separate structural unit) and the mill was transferred to the hot-rolling shop LPTs-1700.

**The hot-rolling shop LPTs-1700 with a XX mm continuous wide-strip hot rolling mill.** The sheet rolling shop comprises of four continuous furnaces, a rolling mill XX (six horizontal stands, including 4 universal in a roughing group and six stands in a finishing group), three coilers, two units for transversal cutting and one for slitting.

The finishing group of stands is equipped with a modern system of automated adjustment of break-down thickness and profile which was installed by „Clecym—company.

The shop produces flat rolled products in coils and sheets of XX mm in thickness, XX mm in width and XX mm in length of carbon and low-alloyed steel. It is possible to produce riffled sheets with lentil patterns. There is a facility of slitting coils into strips XX mm in width.

Workpieces to release a thin sheet in LPTs- XX are rolled slabs of carbon, low-alloyed and alloyed steels, produced in the slabbing Mill XX and cast slabs coming from the oxygen converter shop.
The installed capacity of the shop is 3.802 million tons per year, and the capacity utilization in 2009 was 62.1%; in 2010 – 74.6%, in 2011 – XX %, in 2012 – XX %, and in 2013 – XX %.

A **cold rolling shop** comprises two continuous etching installations, a continuous four-stand CR mill 1700 mm (with the capacity of around XX million tons per year) and one-stand dressing mill, a heat-treating bay with the bell-type furnaces, two continuous hot-dip galvanizing facilities, units for transverse and longitudinal cutting of cold-rolled, hot-rolled and hot-rolled pickled coils (a slitter, two cross-cutters and a combined cutter).

Carbon, low-alloyed steel rolled products in sheets and coils are manufactured in this shop: - cold-rolled strips in coils 0.5-2.0 mm in thickness, 1000-1250 mm in width, and in sheets 0.5-2.0 x 1000-1250 x 2000-2500 mm in size; - cold-rolled strips 0.5-1 x 20-60 mm and 0.5-2.0 mm x 100-650 mm, galvanized strips 0.5-1.0 x 20-60 mm and 0.5-1.5 x 100-650 mm in size; - galvanized strips in coils 0.5-1.5 mm in thickness, 1000-1250 mm in width, and sheets 2000-2500 mm in length.

As the workpiece the shop uses HR coils coming from LPTs XX through the conveyor line.

The installed capacity of the plant in 2009 was XX million tons per year, and the capacity utilization was in 2009 28.7%, in 2010 – 435, in 2011 – XX %, in 2012 – XX %, and in 2013 – XX %.

A **plate rolling shop** XX (LPTs XX) includes a plate mill XX, intended for controlled rolling of strips (roughing and finishing reversing stands quarto). It also comprises four seven-zone continuous walking beam furnaces, roughing and finishing reversing four-high mill stands, dressing, cutting and marking machines, and apparatus for nondestructive testing.

Automatic systems with a high precision guide the process of billet heating, temperature and speed modes of rolling. The shop has the necessary equipment to produce stainless steel coated sheets. The production of the plant is certified by international classification societies: Lloyd's Register (UK, Germany), ABS, TUV (Germany).

Plates of 6.0–60 mm in thickness, 1500–2700 mm in width and up to XX mm in length can be manufactured at this plant (upon special requests — up to XX mm).

As the workpiece the LPTs shop uses blocks coming from the oxygen-converter shop and rolled slans from the slabbing mill 1150.

The installed production capacity of the plant is XX million tons per year, and the capacity utilization was in 2009 - 26.8%; in 2010 – 51.1%, in 2011 – XX %, in 2012 – XX %, and in 2013 – XX %.

A **plate rolling shop** XX (LPTs XX) includes a plate mill XX, nine chamber furnaces, two-high roll mill stand, plate dressing and cutting machines, and nine heat-treating furnaces.

In 2011, the plant was mothballed due to lack of orders and the obsolete equipment.